

Examiner: John Sipos
Art Unit: 3751
Fax No.: 703-872-9306
Phone No.: 571-272-4468

Docket No.: NHL-HOL-61
Serial No.: 10/666,931
Customer No. 00432

Claim Amendments

1. (currently amended) A beverage bottling plant for filling bottles with a liquid beverage filling material, said beverage bottling plant comprising:

a filling machine configured to fill empty bottles with liquid beverage filling material;

said beverage filling machine comprising a plurality of beverage filling positions, each beverage filling position comprising a beverage filling device for filling bottles with liquid beverage filling material;

said filling devices comprising apparatus configured to introduce a predetermined flow of liquid beverage filling material into the interior of bottles to a substantially predetermined level of liquid beverage filling material;

said apparatus configured to introduce a predetermined flow of liquid beverage filling material comprising apparatus configured to terminate the filling of beverage bottles upon liquid beverage filling material reaching said substantially predetermined level in bottles;

a conveyer arrangement configured and disposed to move empty bottles to said filling machine;

a closing station configured to close filled bottles;

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a conveyer arrangement configured and disposed to transfer
filled bottles from said filling machine to said closing station;

a labeling station configured and disposed to label filled bottles
with a label;

a conveyer arrangement configured and disposed to transfer
closed bottles from said closing station to said labeling station;

said labeling station comprising:

a conveyer arrangement configured and disposed to move
closed bottles within said labeling station;

said conveyer arrangement comprising a starwheel having
symmetrically-shaped starwheel pockets being disposed on the
periphery of said starwheel and being configured to receive
bottles to be labeled;

a label storage magazine configured to hold a plurality of
single-sheet labels in a stacked condition;

a label extracting and applying apparatus, with label
grippers, configured and disposed to extract labels from said
label storage magazine and to directly apply an extracted label
on a filled, closed bottle to be labeled disposed in a starwheel
pocket of said starwheel;

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a heating apparatus configured and disposed to directly heat an extracted label, prior to finally applying the label on a filled, closed bottle, thus at least to assist in securing an applied label to a filled, closed bottle;

each of said label grippers being substantially in the shape of a pie piece and having a curved circular outer surface being substantially less than a complete circle; and

each of said pie-piece-shaped label grippers being configured and disposed to grip an extracted label on said outer surface of said label grippers and to release a gripped label to thus permit a label to be applied to a filled, closed bottle; and a conveyer arrangement configured and disposed to remove labeled bottles from said labeling station.

2. (currently amended) The bottling plant according to Claim 1, comprising all of: (A), (B), (C), (D), (E), ~~and~~ (F), and (G), wherein (A), (B), (C), (D), (E), ~~and~~ (F), and (G) comprise:

(A) said heating apparatus to heat a label comprises one of (I), (II), (III), (IV), and (V), wherein (I), (II), (III), (IV), and (V) comprise:

(I) at least one of: a heat radiator, a heating wire, and a

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heated-air blower,

(II) at least one of: an arrangement configured to produce a light beam, an arrangement configured to produce an infrared beam, and an arrangement configured to produce an ultraviolet beam,

(III) an arrangement to produce microwaves,

(IV) an arrangement to produce a laser beam, and

(V) an arrangement to produce ultrasound waves;

(B) said label grippers comprise mechanically actuatable label grippers;

(C) control apparatus for controlling operation of said labeling station;

(D) each of said label grippers is configured and disposed to produce a vacuum to permit removal of a label from said label storage magazine and gripping of the label;

(E) said label extracting and applying apparatus comprises:

a first structure;

a second structure;

said label grippers are mounted on said first structure;

said second structure is configured to receive extracted

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labels from said label grippers on said first structure to permit the labels to be secured to bottles;

said first structure has a central longitudinal axis;

said first structure is configured to rotate about said central longitudinal axis in a substantially circular path;

said second structure has a central longitudinal axis;

said second structure is configured to rotate about said central longitudinal axis of said second structure in a substantially circular path; and

said heating apparatus is disposed adjacent at least one of: said substantially circular path of said first structure, and said substantially circular path of said second structure, to permit heating of a label having a composition on a backside thereof; and

(F) an arrangement configured and disposed to heat said label grippers; and

an arrangement configured and disposed to cool said label grippers; and

(G) said curved circular outer surface of each of said pie-piece-shaped label grippers being about one quarter of a circle.

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3. (currently amended) The bottling plant according to Claim 1, comprising at least one of: (A), (B), (C), (D), (E), ~~and (F)~~, and (G), wherein (A), (B), (C), (D), (E), ~~and (F)~~, and (G) comprise:

(A) said heating apparatus to heat a label comprises one of (I), (II), (III), (IV), and (V), wherein (I), (II), (III), (IV), and (V) comprise:

(I) at least one of: a heat radiator, a heating wire, and a heated-air blower,

(II) at least one of: an arrangement configured to produce a light beam, an arrangement configured to produce an infrared beam, and an arrangement configured to produce an ultraviolet beam,

(III) an arrangement to produce microwaves,

(IV) an arrangement to produce a laser beam, and

(V) an arrangement to produce ultrasound waves;

(B) said label grippers comprise mechanically actuatable label grippers;

(C) control apparatus for controlling operation of said labeling station;

(D) each of said label grippers is configured and disposed to produce a vacuum to permit removal of a label from said label

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storage magazine and gripping of the label;

(E) said label extracting and applying apparatus comprises:

a first structure;

a second structure;

said label grippers are mounted on said first structure;

said second structure is configured to receive extracted
labels from said label grippers on said first structure to permit
the labels to be secured to bottles;

said first structure has a central longitudinal axis;

said first structure is configured to rotate about said
central longitudinal axis in a substantially circular path;

said second structure has a central longitudinal axis;

said second structure is configured to rotate about said
central longitudinal axis of said second structure in a
substantially circular path; and

said heating apparatus is disposed adjacent at least one
of: said substantially circular path of said first structure, and
said substantially circular path of said second structure, to
permit heating of a label having a composition on a backside
thereof; and

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(F) an arrangement configured and disposed to heat said label grippers; and

an arrangement configured and disposed to cool said label grippers; and

(G) said curved circular outer surface of each of said pie-piece-shaped label grippers being about one quarter of a circle.

4. (previously presented) A labeling station for labeling a container, said labeling station comprising:

a moving arrangement configured and disposed to move containers in said labeling station;

a label storage magazine;

a label extracting and applying apparatus, with at least one label gripper, configured and disposed to extract a label from said label storage magazine and to apply a label on a container to be labeled;

a heating arrangement configured and disposed to heat an extracted label, prior to finally securing a label on a container, thus at least to assist in securing a label to a container; and

said at least one label gripper being substantially in the shape of a pie piece and being configured and disposed to grip a label and

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to release a gripped label to permit a label to be secured to a container.

5-36. (canceled)

37. (new) The labeling station according to Claim 4, wherein:
each of said pie-piece-shaped label grippers has a curved circular outer surface being substantially less than a complete circle;
and

each of said label grippers is configured and disposed to grip a label on said outer surface of said label grippers.

38. (new) The labeling station according to Claim 37, wherein said curved circular outer surface of each of said pie-piece-shaped label grippers is about one quarter of a circle.

39. (new) The labeling station according to Claim 38, wherein said heating arrangement comprises at least one of (i) and (ii), wherein (i) and (ii) comprise:

(i) a heating apparatus configured and disposed to directly heat

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a label; and

(ii) an arrangement configured and disposed to heat said at least one label gripper to thus heat a label; and

an arrangement configured and disposed to cool said at least one label gripper.

40. (new) The labeling station according to Claim 39, wherein said moving arrangement comprises a starwheel having symmetrically-shaped starwheel pockets being disposed on the periphery of said starwheel and being configured to receive containers to be labeled.

41. (new) The labeling station according to Claim 40, wherein: said label storage magazine is configured and disposed to store labels having a substance on a backside thereof to permit a label to be secured to a container; and

said heating apparatus comprises one of (I), (II), (III), (IV), and (V), wherein (I), (II), (III), (IV), and (V) comprise:

(I) at least one of: a heat radiator, a heating wire, and a heated-air blower,

(II) at least one of: an arrangement configured to produce

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a light beam, an arrangement configured to produce an infrared beam, and an arrangement configured to produce an ultraviolet beam,

(III) an arrangement to produce microwaves,

(IV) an arrangement to produce a laser beam, and

(V) an arrangement to produce ultrasound waves.

42. (new) The labeling station according to Claim 41, wherein:
one of (A) and (B):

(A) said at least one label gripper comprises a mechanically actuatable label gripper; and

(B) said at least one label gripper is configured and disposed to produce a vacuum to permit removal of a label from said label storage magazine and gripping of the label; and said label extracting and applying apparatus comprises:

a first structure;

a second structure;

said at least one label gripper is mounted on said first structure; and

said second structure is configured to receive extracted

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labels from said label grippers on said first structure to permit the labels to be secured to bottles;
said first structure has a central longitudinal axis;
said first structure is configured to rotate about said central longitudinal axis in a substantially circular path;
said second structure has a central longitudinal axis;
said second structure is configured to rotate about said central longitudinal axis of said second structure in a substantially circular path;
said heating apparatus is disposed adjacent at least one of: said substantially circular path of said first structure, and said substantially circular path of said second structure, to permit heating of a label having an adhesive on a backside thereof; and
the labeling station comprises control apparatus for controlling operation of said labeling station.

43. (new) The labeling station according to Claim 4, wherein said heating arrangement comprises:

a heating apparatus configured and disposed to directly heat a label;

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an arrangement configured and disposed to heat said at least one label gripper to thus heat a label; and

an arrangement configured and disposed to cool said at least one label gripper.

44. (new) A method of operating a labeling station for labeling a container, said labeling station comprising: a moving arrangement configured and disposed to move containers by said labeling station; a label storage magazine; a label extracting and applying apparatus, with at least one label gripper, configured and disposed to extract a label from said label storage magazine and to apply a label on a container to be labeled; a heating arrangement configured and disposed to heat an extracted label, prior to finally securing a label on a container, thus at least to assist in securing a label to a container; and said at least one label gripper being substantially in the shape of a pie piece and being configured and disposed to grip a label and to release a gripped label to permit a label to be secured to a container, said method comprising the steps of:

removing a label from said label storage magazine with said label extracting and applying apparatus;

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gripping a label with said at least one pie-piece-shaped label gripper;

heating a label with said heating arrangement, prior to finally securing a label on a container, thus at least to assist in securing a label to a container;

releasing a gripped label from said at least one pie-piece-shaped label gripper to thus permit a label to be applied to a container; and applying a heated label on a container.

45. (new) The method of operating a labeling station according to Claim 44, wherein said at least one pie-piece-shaped label gripper has a curved circular outer surface being substantially less than a complete circle; and said at least one label gripper is configured and disposed to grip a label on said outer surface of said at least one label gripper; and wherein said step of gripping a label comprises gripping a label on said outer surface of said at least one label gripper.

46. (new) The method of operating a labeling station according to Claim 45, wherein said curved circular outer surface of said at

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least one pie-piece-shaped label gripper is about one quarter of a circle.

47. (new) The method of operating a labeling station according to Claim 46, wherein said label storage magazine is configured and disposed to store labels having a heat-activatable adhesive on a backside thereof to permit a label to be secured to a container, said method comprising the steps of:

storing labels having a heat-activatable adhesive on a backside thereof in said label storage magazine;

said step of removing a label from said label storage magazine comprises removing a label having a heat-activatable adhesive on a backside thereof;

said step of gripping a label with said at least one label gripper comprises gripping a label having a heat-activatable adhesive on a backside thereof;

said step of heating a label with said heating arrangement, prior to finally securing a label on a container, thus at least to assist in securing a label to a container, comprises heating a label having a heat-activatable adhesive on a backside thereof;

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said step of releasing a gripped label from said at least one label gripper to thus permit a label to be secured to a container, comprises releasing a label having a heat-activatable adhesive on a backside thereof; and

said step of applying a heated label comprises applying a label having a heated adhesive on a backside thereof on a container to be labeled.

48. (new) The method of operating a labeling station according to Claim 47, wherein at least one of (i) and (ii):

(i) said heating arrangement comprises a heating apparatus configured and disposed to directly heat a label; and

said step of heating a label with said heating arrangement comprises directly heating the heat-activatable adhesive with said heating apparatus;

(ii) said heating arrangement comprises:

an arrangement configured and disposed to heat said at least one label gripper to thus heat a label and the heat-activatable adhesive thereon; and

an arrangement configured and disposed to cool said at

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least one label gripper; and

said method further comprises the steps of:

heating with said heating arrangement said at least one label gripper to thus heat a label and the heat-activatable adhesive thereon; and

cooling with said cooling arrangement said at least one label gripper upon said at least one label gripper being heated and after release of a label being gripped by said at least one label gripper.

49. (new) The method of operating a labeling station according to Claim 48, wherein said moving arrangement comprises a starwheel having symmetrically-shaped starwheel pockets being disposed on the periphery of said starwheel and being configured to receive bottles to be labeled.

50. (new) The method of operating a labeling station according to Claim 49, wherein said heating apparatus comprises one of (I), (II), (III), (IV), and (V), wherein (I), (II), (III), (IV), and (V) comprise:

(I) at least one of: a heat radiator, a heating wire, and a

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heated-air blower,

(II) at least one of: an arrangement configured to produce a light beam, an arrangement configured to produce an infrared beam, and an arrangement configured to produce an ultraviolet beam,

(III) an arrangement to produce microwaves,

(IV) an arrangement to produce a laser beam, and

(V) an arrangement to produce ultrasound waves.

51. (new) The method of operating a labeling station according to Claim 50, wherein

one of (A) and (B):

(A) said at least one label gripper comprises a mechanically actuatable label gripper to permit removal of a label from said label storage magazine and gripping of the label; and

(B) said at least one label gripper is configured and disposed to produce a vacuum to permit removal of a label from said label storage magazine and gripping of the label;

said step of removing a label from said storage magazine comprises removing a label by generating a vacuum sufficient to

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remove a label from said label storage magazine; and

said step of gripping a label comprises maintaining the vacuum to grip the label;

said label extracting and applying apparatus comprises:

a first structure;

a second structure;

said at least one label gripper is mounted on said first structure;

said second structure is configured to receive extracted labels from said label grippers on said first structure to permit the labels to be secured to bottles;

said first structure has a central longitudinal axis;

said first structure is configured to rotate about said central longitudinal axis in a substantially circular path;

said second structure has a central longitudinal axis; and

said second structure is configured to rotate about said central longitudinal axis of said second structure in a substantially circular path;

said heating apparatus is disposed adjacent at least one of: said substantially circular path of said first structure, and said substantially

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circular path of said second structure, to permit heating of a label having an adhesive on a backside thereof;

said labeling station comprises control apparatus for controlling operation of said labeling station; and

said method further comprises the step of controlling with said control apparatus operation of said labeling station, including said heating arrangement.

52. (new) The method of operating a labeling station according to Claim 47, wherein:

said heating arrangement comprises:

a heating apparatus configured and disposed to directly heat a label;

an arrangement configured and disposed to heat said at least one label gripper to thus heat a label and the heat-activatable adhesive thereon; and

an arrangement configured and disposed to cool said at least one label gripper;

said step of heating a label with said heating arrangement comprises the steps of:

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heating said at least one label gripper to thus heat a label
and the heat-activatable adhesive thereon;

directly heating the heat-activatable adhesive with said
heating apparatus to further heat the heat-activatable adhesive;
and

cooling with said cooling arrangement said at least one
label gripper upon said at least one label gripper being heated
and after release of a label being gripped by said at least one
label gripper.